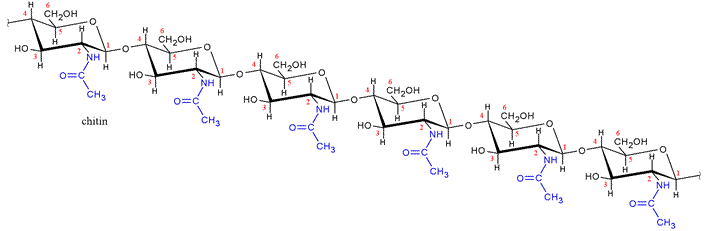
Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Connecting Structure to Function in Carbohydrates and Lipids**

Ms. OK, AP Biology, 2014-2015

Below is a picture of a chitin molecule, which is found in the exoskeleton (i.e. the hard outer skeleton) of insects and crustaceans (ex: crabs). Chitin is also used in surgical thread (SO COOL!) because it is strong and biodegradable (i.e. breaks down naturally in the body).



Chitin is made of modified glucose monomers with one hydroxyl group replaced with an acetyl amine group (contains nitrogen). Within chitin, the glucose monomers are linked together by 1,4 beta linkages. Hydrogen bonding occurs between the acetyl amine groups on adjacent chitin molecules.

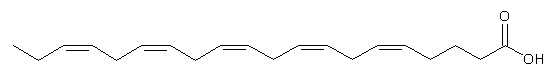
1. Answer the following questions about chitin given below based on the information and image in the passage above.

A. Is chitin a carbohydrate or lipid? How do you know?

B. Is chitin a monomer or a polymer? How do you know?

C. Explain how the structure of chitin contributes to its function.

Below is a picture of EPA (Eicosapentaenoic acid), a molecule found in fish (especially salmon). Humans often take this molecule as a supplement to assist with joint pain due to inflammation, arthritis, etc. In the image below, any bend in the line represents a carbon atom. Where there are two lines, this represents a double bond between two carbon atoms. Hydrogen atoms are assumed to be branching off the carbon atoms in the chain, though they are not shown in the image.



2. Answer the following questions about EPA given below based on the information and image in the passage above.

A. Is EPA a carbohydrate or lipid? How do you know?

B. What can you infer about the type of carbohydrate or lipid based on the presence of carbon to carbon double bonds in this molecule?

C. Would this molecule be solid or liquid at room temperature, and how do you know?

D. Would consuming this molecule be negative for human cardiovascular health? Why or why not?

E. Would this molecule be attracted to or repelled by water? How do you know?